which may be denoted by T_0, another part T_1, involves the first powers, and a third T_2 involves the squares and products of the same; then $T = T_0 + T_1 + T_2$. By the theory of homogeneous functions

$$\Sigma_i(p_i q_i') = \Sigma_i\left(\frac{dT}{dq_i'} q_i'\right) = T_1 + 2T_2.$$

Hence, writing

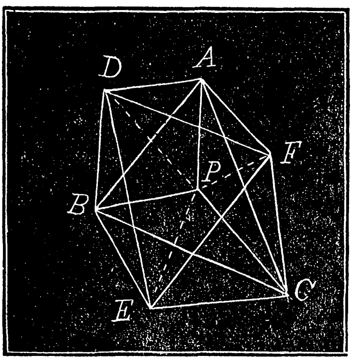
$$\Omega' = \Omega + T_0,$$

$$H = T_2 - \Omega'.$$

GEOMETRICAL PROBLEM.

BY T. P STOWELL, ROCHESTER, N, Y.

In any triangle whose angles are all known, as also the distances from the three angles to any point either within or without the triangle, the sides may be found as follows:



Let ABC be the triangle, and P a point whose distances PA, PB and PC are given; revolve the triangle APC over the side AC, P will be at F; and APB revolved over AB, P will be at D; also BPC revolved over BC, P will be at E; then join DE, EF and FD.

The $\triangle$AFD is known, having two equal sides, AF and AD, and the included angle DAF double the angle BAC. Hence DF is known. Similarly FE and DE are known, and therefore all the angles of the $\triangle$ DEF are known. Consequently $\angle$ APC = AFD + DFE + CFE, and therefore the sides AC, AB and BC are easily found. This question admits of an easy geometrical construction.

NOTE ON THE SOLUTION OF QUADRATIC EQUATIONS, BY WM. ROCK, C. E., EAGLE VILLAGE, N. Y.—The following method of solving Quadratic Equations does not appear in many excellent books on Algebra. The object of the method is to solve any quadratic equation without involving fractions.

$$\text{Let } ax^2 + 2bx = n \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

be any quadratic. Assume $x = y \div a$, then will $ax^2 = y^2 \div a$, and $2bx = 2by \div a$. Substitute these values in the given equation and we have

$$\frac{y^2}{a} + \frac{2by}{a} = n \ldots\ldots\ldots\ldots\ldots\ldots 2).$$

Multiply (2) by a and we have

$$y^2 + 2by = an \ldots\ldots\ldots\ldots\ldots\ldots (3).$$

We have thus removed th e coefficient of x^2 without changing that of x. Solving (3) by the ordinary rule, we have

$$y = -b \pm \sqrt{an + b^2}.$$

Hence

$$x = \frac{y}{a} = \frac{-b \pm \sqrt{an + b^2}}{a},$$

which gives the following arithmetical

Rule: If the coefficient of x is an odd number double the whole eqution, then multiply the right hand member by the coefficient of x^2, to the product add the square of half the coefficient of x, extract the square root of the result, connect this square root with half the coefficient of x with its sign changed and divide this result by the coefficient of x^2; the quotient is the value of x.

Numerical Example.—Let $11x^2 - 17x = 108$.

Since the coefficient of x is odd, double the equation and apply the rule to the resulting equation:

$22x^2 - 34x = 216$. Then $216 \times 22 = 4752$, add $(\frac{1}{2} \times 34)^2 = 17^2 = 287$, and we have $4752 + 289 = 5041$, extracting square root of this sum we have $\sqrt{5041} = \pm 71$. Hence

$$x = \frac{17 \pm 71}{22} = 4 \text{ or } -2\tfrac{6}{11}.$$